

are in connection, for example, with partial differential equations, harmonic analysis, quantum mechanics, group representations, and the analysis on manifolds. The authors have taken the opportunity to correct errors, terminological variations, and expository lapses of the first edition.

*J. Szűcs (Szeged)*

**Larry Smith, Linear Algebra** (Undergraduate Texts in Mathematics), VII+280 pages, Springer-Verlag, New York—Heidelberg—Berlin, 1978.

This text is written for students, versed in one-variable calculus and having little contact with complex numbers and abstract algebra. It deals almost exclusively with real finite dimensional vector spaces in a setting and formulation that permits easy generalization to abstract vector spaces. The parallel complex theory is developed in exercises.

The first 7 chapters contain an elementary introduction. The notions of a vector space, subspace, linear independence, bases etc. are illuminated by a large number of examples and exercises.

The central topic of the book is the principal axis theorem for real symmetric linear transformations, in which a more or less direct path is followed. This is done in the subsequent chapters from 8 to 16, in which the notions of a linear transformation, matrices, eigenvalue and eigenvector, inner product space, quadratic form etc. and the more important properties, interrelations and applications (for example, to systems of linear equations) are developed.

The main value of the book is that the presentation is as concrete as possible, and it provides a wide selection of examples of vector spaces and linear transformations that may serve as a testing ground for the theory.

The book is a good introduction to linear algebra. Although there are many areas that are not included (and this is intentional on the part of the author), the theory developed contains the essentials of linear algebra. The book will be useful for both students and lecturers.

*F. Móricz (Szeged)*

### Livres reçus par la rédaction

- J. Bellach—P. Franken—E. Warmuth—W. Warmuth, Mass, Integral und bedingter Erwartungswert** (Wissenschaftliche Taschenbücher, 226), 145 Seiten, Akademie-Verlag, Berlin, 1978. — 8,— M.
- A. Bensoussan—J. L. Lions, Applications des inéquations variationnelles en contrôle stochastique** (Méthodes Mathématiques de l'Informatique, 6), IX+545 pages, Dunod, Paris, 1978. — 180 f.
- A. L. Besse, Manifolds all of whose geodesics are closed** (Ergebnisse der Mathematik und ihrer Grenzgebiete — A Series of Modern Surveys in Mathematics, 93), IX+262 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 78,—.
- A. Bressan, Relativistic theories of materials** (Springer Tracts in Natural Philosophy, Vol. 29), XIV+290 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 98,—.
- A. Brown—C. Percy, Introduction to operator theory. I. Elements of functional analysis** (Graduate Texts in Mathematics, Vol. 55), XIV+474 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 54,—.

- Th. S. Chihara**, *An introduction to orthogonal polynomials* (Mathematics and its applications, vol. 13), XII+249 pages, Gordon and Breach, New York—London—Paris, 1978. — £ 26.30.
- J. S. R. Chisholm**, *Vectors in three-dimensional space*, XII+293 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 15.00.
- P. Collet—J. P. Eckmann**, *A renormalization group analysis of the hierarchical model in statistical mechanics* (Lecture Notes in Physics, Vol. 74), III+199 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 21,—.
- F. H. Croom**, *Basic concepts of algebraic topology* (Undergraduate Texts in Mathematics), X+177 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 36,—.
- B. Davis**, *Integral transforms and their applications* (Applied Mathematical Sciences, Vol. 25), XII+411 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 32,—.
- H. H. Goldstine**, *A history of numerical analysis from the 16th through the 19th century* (Studies in the History of Mathematics and Physical Sciences, Vol. 2), XIV+348 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 54,—.
- H. Grauert—W. Fischer**, *Differential- und Integralrechnung. II* (Heidelberger Taschenbücher, 36), 3., verb. Aufl., XII+227 Seiten, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 16,80.
- J. E. Graver—M. E. Watkins**, *Combinatorics with emphasis on the theory of graphs* (Graduate Texts in Mathematics, Vol. 54), XV+351 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 54,—.
- U. Grenander**, *Pattern analysis. Lectures in pattern theory, Vol. II* (Applied Mathematical Sciences 24), VIII+605 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 39,—.
- P. Hájek—T. Havránek**, *Mechanizing hypothesis formation. Mathematical foundations for a general theory* (Universitext), XV+396 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 48,—.
- A. G. Hamilton**, *Logic for mathematicians*, VIII+224 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 4.95.
- R. Hartshorne**, *Algebraic geometry* (Graduate Texts in Mathematics, Vol. 52), XVI+496 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 53,30.
- C. C. Heyde—E. Seneta, I. J. Bienaymé**, *Statistical theory anticipated* (Studies in the History of Mathematics and Physical Sciences, Vol. 3), XIV+172 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 46,—.
- H. Heyer**, *Probability measures on locally compact groups* (Ergebnisse der Mathematik und ihrer Grenzgebiete — A Series of Modern Surveys in Mathematics, 94), X+531 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 120,—.
- P. G. Hinman**, *Recursion-theoretic hierarchies* (Perspectives in Mathematical Logic), XII+480 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 88,—.
- Invariant Wave Equations**. Proceedings of the "Ettore Majorana" International School of Mathematical Physics, held in Erice, June 27 to July 9, 1977 (Lecture Notes in Physics, 73), Edited by G. Velo and A. S. Wightman, VI+416 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978.
- M. Karoubi**, *K-Theory* (Grundlehren der mathematischen Wissenschaften — A Series of Comprehensive Studies in Mathematics, 226), XVIII+308 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 78,—.
- W. Klingenberg**, *A course in differential geometry* (Graduate Texts in Mathematics, Vol. 51), Translated from the German by D. Hoffman, XII+178 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 32,20.

- W. Klingenberg, *Lectures on closed geodesics* (Grundlehren der mathematischen Wissenschaften — A Series of Comprehensive Studies in Mathematics, 230), XI+227 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 65,—.
- I. Lakatos, *The methodology of scientific research programmes. Philosophical papers, Vol. 1*. Edited by J. Worrall and G. Currie, VIII+250 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 9.00.
- I. Lakatos, *Mathematics, science and epistemology. Philosophical papers, Vol. 2*. Edited by J. Worrall and G. Currie, XI+285 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 10.50.
- E. J. LeCuyer, *Introduction to college mathematics with a programming language* (Undergraduate Texts in Mathematics, XII+420 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 34.50.
- J. Lighthill, *Waves in fluids*, XV+504 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 17.50.
- R. S. Liptser—A. N. Shirayev, *Statistics of random processes. I. General theory* (Applications of Mathematics, Vol. 5), translated from the Russian by A. B. Aries, X+394 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 64,80.
- R. S. Liptser—A. N. Shirayev, *Statistics of random processes. II. Applications* (Applications of Mathematics, Vol. 6), translated from the Russian by A. B. Aries, X+339 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 66,—.
- M. Loève, *Probability theory. II* (Graduate Texts in Mathematics, Vol. 46), 4th edition (Originally published by Van Nostrand Publishing Company), XVI+413 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 43,10.
- N. G. Lloyd, *Degree theory* (Cambridge Tracts in Mathematics, 73), X+172 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 8.50.
- Yu. I. Manin, *A course in mathematical logic* (Graduate Texts in Mathematics, Vol. 53), translated from the Russian by N. Koblitz, XIII+286 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977. — DM 46,—.
- Mathematical Problems in Theoretical Physics*. International Conference, held in Rome, June 6—15 1977 (Lecture Notes in Physics, Vol. 80), Edited by G. Dell'Antonio, S. Doplicher and G. Jona-Lasinio, VI+438 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 35,50.
- S. G. Michlin, *Partielle Differentialgleichungen in der mathematischen Physik* (Mathematische Lehrbücher und Monographien, I. Abteilung: Mathematische Lehrbücher, Bd. 30), XIV+519 Seiten, Akademie-Verlag, Berlin, 1978. — 78,— M.
- W. Nef, *Beiträge zur Theorie der Polyeder mit Anwendungen in der Computer-graphik*, 306 Seiten, Herbert Lang & Cie AG, Bern, 1978. — Sfr. 32,—.
- Proceedings of the 10th Symposium on Ring Theory*, held at Shinshu University, Matsumoto, August 18—20, 1977. Edited by S. Endo, M. Harada, H. Tachikawa and H. Tominaga, IX+120 pages, Okayama, 1978.
- J. S. Rose, *A course on group theory*, IX+310 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 4.95.
- S. Schach—T. Schafer, *Regressions- und Varianzanalyse* (Hochschultext), VIII+262 Seiten, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 29,—.
- I. E. Segal—R. A. Kunze, *Integrals and operators* (Grundlehren der mathematischen Wissenschaften — A Series of Comprehensive Studies in Mathematics, 228), 2nd, revised and enlarged edition, XIV+371 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 74,—.

- A. N. Shirayev**, *Optimal stopping rules* (Applications of Mathematics, Vol. 8), 3rd edition, translation from the Russian by A. B. Aries, X+217 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 54,—.
- D. J. Shoesmith—T. J. Smiley**, *Multiple-conclusion logic*, XIII+396 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978.
- L. Smith**, *Linear algebra* (Undergraduate Texts in Mathematics), VII+280 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 27,—.
- J. R. Strooker**, *Introduction to categories, homological algebra and sheaf cohomology*, IX+246 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 12.50.
- E. O. Thorp**, *Elementary probability*, X+152 pages, R. E. Krieger, Huntington, New York, 1977.
- A. Van Daele**, *Continuous crossed products and type III von Neumann algebras* (London Mathematical Society Lecture Note Series, 31), VII+68 pages, Cambridge University Press, Cambridge—London—New York—Melbourne, 1978. — £ 3.95.
- Wave Propagation and Underwater Acoustics**, edited by B. Keller and J. S. Papadakis (Lecture Notes in Physics, 70), VIII+287 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1977.
- J. Wolfowitz**, *Coding theorems of information theory* (Ergebnisse der Mathematik und ihrer Grenzgebiete — A Series of Modern Surveys in Mathematics, 31), 3rd edition, XI+173 pages, Springer-Verlag, Berlin—Heidelberg—New York, 1978. — DM 54,—.